

RESPONSE TO INTERVENTION AT THE SECONDARY LEVEL:
IDENTIFYING STUDENTS AT RISK FOR HIGH SCHOOL DROPOUT

By

Carrie Lisa Semmelroth

A thesis

submitted in partial fulfillment
of the requirements for the degree of
Master of Arts in Special Education
Boise State University

May 2009

© 2009

Carrie Lisa Semmelroth

ALL RIGHTS RESERVED

BOISE STATE UNIVERSITY GRADUATE COLLEGE

DEFENSE COMMITTEE AND FINAL READING APPROVALS

of the thesis submitted by

Carrie Lisa Semmelroth

Thesis Title: Response to Intervention at the Secondary Level: Identifying Students At Risk for High School Dropout

Date of Final Oral Examination: 03 April 2009

The following individuals read and discussed the thesis submitted by student Carrie Lisa Semmelroth, and they also evaluated her presentation and response to questions during the final oral examination. They found that the student passed the final oral examination, and that the thesis was satisfactory for a master's degree and ready for any final modifications that they explicitly required.

Keith W. Allred, Ph.D. Chair, Supervisory Committee

Evelyn S. Johnson, Ed.D. Member, Supervisory Committee

Roger A. Stewart, Ph.D. Member, Supervisory Committee

The final reading approval of the thesis was granted by Keith W. Allred, Ph.D, Chair of the Supervisory Committee. The thesis was approved for the Graduate College by John R. Pelton, Ph.D., Dean of the Graduate College.

ACKNOWLEDGEMENTS

It is with genuine appreciation that I acknowledge those that have supported me in the fulfillment of my degree. Thank you to my committee of Dr. Keith Allred, Dr. Evelyn Johnson and Dr. Roger Stewart who have spent many hours reviewing and advising, and have been patient and attentive to my deadlines. Thank you to my friends and family who have been supportive and understanding during these last two years. Lastly, thank you to Frankie and Livingston for being great sources of comfort during this process.

ABSTRACT

Using the basic premise of RTI, which is to identify those students *at risk*, in order to provide timely intervention, this study contributes to the development of a universal screening measure to identify high school at risk of drop out. This study was designed to apply the Early Warning System (EWS) tool developed by the National High School Center as a possible Tier 1 universal screening measure to identify students at risk as part of an RTI framework for the secondary school level. Freshmen data from one high school from the 2004-2005 school year was entered into the EWS tool and compared against the graduation outcomes for the eventual 2007-2008 senior class. Predictor and outcome variables were applied in a logistic regression statistical model and statistical significance was found for the “Quarter 2 absence” and “Core courses failed” predictor variables.

Further research is needed in this area to deepen the understanding of building, implementing and maintaining RTI frameworks at the secondary level. Further research is also needed to define predictor variables unique to Idaho for students at risk for drop out.

TABLE OF CONTENTS

ABSTRACT	v
LIST OF TABLES	vii
CHAPTER 1: INTRODUCTION TO THE STUDY.....	1
Introduction	1
Purpose.....	2
Rationale	3
CHAPTER 2: LITERATURE REVIEW	4
The RTI Framework	4
Standard Protocol and Problem-Solving	5
RTI at the Secondary Level	6
Ninth Grade as “Make or Break” Year	8
Predictor Indicators	9
Issues Related to Dropout Definitions, Rates and Reporting	13
CHAPTER 3: METHODS	18
Design of the Study	18
Sample and Population	18
Data Collection	19
The Dependent Variable	19
Independent Variables	19
Binary Variables	21
CHAPTER 4: RESULTS	22

Results	22
CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	27
Summary	27
Limitations	27
Conclusions	28
Recommendations	30
REFERENCES	32

LIST OF TABLES

<i>Table 1. Freshman On- and Off-track Indicators for an Idaho School Requiring 46 Credits to Graduate</i>	10
<i>Table 2. Summary of “High-Yield” Indicators</i>	12
<i>Table 3. Definition of “dropout” in the state of Idaho</i>	17
<i>Table 4. Binary Variables</i>	21
<i>Table 5. Summary of Efficiency for EWS Flags, First 20 Days Flags and On-track Indicators for Predicting High School Outcomes (N=172)</i>	23
<i>Table 6. Summary of Spearman’s rho Correlation Analysis for Variables Predicting High School Outcomes (N=172)</i>	24
<i>Table 7. Results of Logistic Regression with all Predictor Variables</i>	25

CHAPTER 1: INTRODUCTION TO THE STUDY

Introduction

Although there have been substantial amounts of research in the area of high school outcomes, it has only been in the past few years with the advancement of No Child Left Behind (NCLB) state accountability standards that states have been required to collect data and report rates related to high school outcomes (Swanson, 2004). As a result, inconsistent methods to collect and report graduation rates across the nation have hidden the true number of students at risk for dropout.

While there is an established need for a system-wide response to improve student outcomes, there has yet to be a generally accepted theoretical framework realized for the secondary level. A growing body of research in response to intervention (RTI) conceptualization and implementation has progressed during the past few years, but this focus has remained primarily at the elementary level as an alternative to the discrepancy model to determine special education eligibility (Fuchs & Fuchs, 2006; Fuchs & Fuchs, 2007). However, RTI frameworks at the secondary level to improve outcomes show promise. Emphasized in the general education setting, RTI provides for prevention and early intervention of students' learning difficulties (Mellard & Johnson, 2008).

Research demonstrates that ninth grade is a "make or break" year for high school outcomes, and predictor indicators based on readily accessible sets of student data can be used as an early warning system (Heppen, O'Cummings, & Therriault, 2008). Within an RTI framework at the secondary level, one possible universal screening measure (Tier 1) might be an early warning system to alert school communities of students at risk of

dropout. Data demonstrates a clear need for an early warning system to identify students at risk and improve outcomes, and this may be effectively accomplished using the RTI framework at the secondary level.

Purpose

This study was designed to apply the Early Warning System (EWS) tool developed by the National High School Center as a possible universal screening measure to identify students at risk as a possible RTI framework for the secondary school level. The EWS tool used in this research project was originally developed in a large urban area; the application of this tool in a less urbanized area, i.e. Idaho, was also purposeful to this project to determine the applicability of the tool. The essential function of the EWS tool identifies students at risk and off-track for graduation. Additionally, using predictors based on quarterly attendance and semester course performance, students can be progress monitored for a range of identified needs (Jerald, 2006; Heppen, O’Cummings, & Therriault, 2008).

Thus, this examination is based on the question, “what are possible predictors for successful and unsuccessful outcomes (i.e. graduated or not) of Idaho high school students?” It is the intent that the results will deepen the understanding of RTI processes at the secondary school level. Using the basic premise of RTI, which is to identify those students *at risk*, this study contributes to current bodies of knowledge. The application of the EWS will attempt to explore the effectiveness of the tool with a different population; i.e. Idaho high school.

Rationale

As RTI was legitimized in the most recent authorization of the Individuals with Disabilities Improvement Education Act (2004), it is a relatively new conceptualization

(Samuels, 2009). The RTI frameworks that have been researched the most up to this date have been those that are focused at the elementary level, and especially those frameworks that apply RTI to determine special education eligibility for a Learning Disability (Johnson, Mellard, & Byrd, 2005). However, there is a compelling need to develop research-based RTI frameworks for the secondary level. Nationally, there is a social and political responsibility to address and prevent high school dropout. At the state level, Idaho's RTI initiative (evidenced by the State Department of Idaho's RTI Team and the State Leadership Group) marks the beginning of a state commitment to develop and implement RTI frameworks.

Although RTI is currently beneficial in early intervention for students with learning disabilities, the framework has applications beyond the elementary level. RTI also increases instructional quality and informed instruction for the general education population by targeting students at risk for school failure. Similarly, the RTI framework at the secondary level will provide for accurate and efficient screening procedures to identify students at risk for dropout.

CHAPTER 2: LITERATURE REVIEW

The RTI Framework

The reauthorization of IDEA 2004 allows educators to use a process that is “based on the child’s response to scientific, research based intervention” and does not require the use of a discrepancy to determine eligibility to special education (Burns & Gibbons, 2008, p. 7). This process is known as response to intervention (RTI), and is conceptualized as a multi-tiered approach.

RTI is a framework to identify students at risk for school failure and when appropriately implemented can, “identify struggling students early, provide appropriate instructional interventions” and increase the likelihood that students will be “successful and maintain their class placement” (Mellard & Johnson, 2008, p. 1).

Moreover, Mellard & Johnson (2008) affirm RTI as a three-tiered model that:

...aligns the instructional needs of students with increasingly intense interventions in the same way the public health model is organized with primary, secondary, and tertiary intervention levels (p. 63).

Similarly, Shores & Bender (2007b) define RTI as a process that implements “high quality, scientifically validated instructional practices” based on the needs of the learner, while also monitoring student progress, and adjusting instruction based on the student’s development (p. 7).

RTI is found most commonly at the elementary level for initial referrals to special education to identify students with a learning disability (LD). The RTI model serves three distinct functions within a school setting: screening and prevention, early intervention, and disability determination (Mellard & Johnson, 2008). Fuchs and Fuchs (2005)

describe policymakers as having “high hopes” that RTI will guide practitioners to intervene earlier for a greater number of students at risk for school failure, that it will represent a more valid measure of LD identification, and that it will decrease the number of “false positives” given to students who are low achievers due to poor instruction and not due to an inherent disability (p. 57).

Standard Protocol and Problem-Solving

RTI is commonly found as two different types of approaches: standard protocol and problem solving. Standard protocol, or standard treatment protocol, involves several separate educational interventions that have been validated as effective through experimental studies (Mellard & Johnson, 2008). Currently, the majority of interventions are designed to examine causes of reading failure and identify remediation strategies, but work in math and writing is emerging (Mellard & Johnson, 2008). These standard protocol strategies progress in intensity over time, prior to the determination of a learning disability (Bender & Shores, 2007; Griffiths et al., 2009).

The problem solving approach uses supports already in place, i.e. a problem solving team, to identify the needs of a target student based on collected data (Shores & Bender, 2007a). Mellard and Johnson (2008) note that the problem solving approach emphasizes a behavioral description of the student’s performance that can be quantified as in a curriculum-based measurement (CBM). The problem-solving approach mirrors the professional teaching and learning cycle in which teachers, “study, select, plan, implement, analyze, and adjust their instruction based on the needs of the students” (Mellard & Johnson, 2008, p. 85).

Shores and Bender (2007a) summarize that both RTI approaches require research-based interventions, ongoing progress monitoring and measures to preserve integrity and

fidelity. However, the primary difference between the two is that the standard protocol model relies on interventions designed for small groups experiencing the same academic problem, while the problem-solving model involves interventions targeted for individual student needs.

RTI at the Secondary Level

The RTI framework is generally accepted at two different school levels: the elementary and secondary (middle and high school) levels. While research and knowledge continues to grow at the elementary level to implement and apply RTI frameworks to identify students at risk, Samuels (2009) writes, “the flame abruptly fizzles out” for RTI implementation at the secondary level (p. 20). Up to this date, research and federal law have paid the most attention to RTI as an alternative to identify students with learning disabilities (Johnson & Smith, 2008; Duffy, 2007). Burns & Gibbons (2008) note that RTI implementation has “clearly focused” on the elementary level, with few attempts at the secondary level (p. 10). Current education policy does not mandate that RTI frameworks be implemented, but as the body of knowledge continues to grow, the benefits of the framework become stronger.

Currently, there are a handful of successful implementations of RTI frameworks at the secondary level occurring around the country. Burns and Gibbons (2008) provide locations of three examples, the Illinois Alliance for School-based Problem Solving and Intervention Resources in Education, the St. Croix River Education District in Minnesota, and the Chester County, Pennsylvania school system (p. 84). Canter et al. (2008) briefly describe the implementation of an RTI program in the East Central School District in Minnesota, leveled at grade 8 to target the eventual grade 11 population required to take a math test to graduate.

In Colorado, RTI at the secondary level is taking shape due to state plans to drop IQ tests as a method for determining learning disabilities by August 2009 (Samuels, 2009). One highlight from Colorado includes Johnson and Smith's (2008) review of the process of a middle school's efforts to implement a problem-solving RTI approach, which began during the 2006-2007 school year. Another highlight comes from Samuels' (2009) snapshots of the progress of two high schools also attempting to implement the problem-solving RTI approach. Preliminary results indicate that students who received intervention in Integrated Algebra and Geometry were earning better grades after several weeks, compared to their peers who were not receiving the services (Samuels, 2009).

In California, schools are not permitted to use IQ-Achievement testing as a criterion for determining eligibility for special education services (Duffy, 2007). The Long Beach Unified School District uses tiered interventions to identify, among other outcomes, those eighth graders transitioning into ninth grade who may be half a year to two years below grade reading level (Duffy, 2007).

Despite the potential of these examples, there is in short, no research-based RTI model or framework for the secondary school level. There is currently a lack of scientific literature that defines what RTI at the secondary level looks like (Samuels, 2009). For those school districts across the country attempting to implement RTI frameworks at the secondary level, there is little to no empirical evidence that supports their efficacy. There are pockets of improvements of student achievement, but there has yet to be solid, validating scientific data. This might be due in part to the different needs, educational goals, and outcomes the secondary level poses from the LD identification emphasis found at the elementary level. Nevertheless, both the elementary and secondary settings benefit

from interventions that identify and address those students at risk for academic failure. As

Duffy (2007) notes:

RTI constructs hold great promise for high schools, particularly for programs and progress monitoring of specific interventions that focus on high school-related issues like transitions and dropout prevention (p. 7).

Within the RTI framework, Tier 1 represents screening of all students at risk for school failure (Fuchs & Fuchs, 2005), and current research indicates that identification at the secondary level could begin as early as the first month of the freshman year in a four-year high school (Allensworth & Easton, 2007; Heppen, O’Cummings, & Therriault, 2008).

Moreover, research has demonstrated that ninth grade, i.e. a student’s first year in high school, is the “make or break” year for high school completion (Heppen, O’Cummings, & Therriault, 2008). Nield et al.’s (2008) research in Philadelphia verifies that the ninth grade experience contributes substantially to the probability of dropping out, despite controls for “demographic and family characteristics, previous school performance and pre-high school attitudes and ambitions” (p. 558).

Ninth Grade as “Make or Break” Year

As previously mentioned, RTI has yet to be conventionally realized at the secondary level, and similarly, there is almost no research using or connecting RTI frameworks for early indications of high school dropouts (Samuels, 2009; Duffy 2007). Although research literature has demonstrated that the first year in high school can also be a crucial indicator for dropout and graduation outcomes (Herlihy, 2007), research-based RTI frameworks for the secondary setting have yet to emerge. One promising area for developing a basis for secondary RTI frameworks is as a universal screening measure to identify students at risk for high school dropout.

The Philadelphia Educational Longitudinal Study (PELS) and the Consortium on Chicago School Research (CCSR) are two foundational studies that have indicated the importance of high school transition and the powerful indicators that the first year in high school yields for predicting students at risk for dropping out of high school (Jerald, 2006; Heppen, O’Cummings, & Therriault, 2008; Neild et al., 2008). Research studies in urban areas, like those in Chicago and Philadelphia, indicate that ninth grade is a crucial benchmark, and can predict by the end of the year if a student will complete high school (Heppen, O’Cummings, & Therriault, 2008; Jerald, 2006). Specifically, two of the most powerful research-based predictors of whether a student will complete high school are attendance and course performance from the first year of high school (Allensworth & Easton, 2007).

Predictor Indicators

The National High School Center has developed an Early Warning System (EWS) tool for the first-year transition to high school using student data based on attendance, course performance (based on GPA, courses completed and failed) and the “on-track” indicator (a combination of course failures in core academic course and credits earned) to identify students at risk (Heppen, O’Cummings, & Therriault, 2008). This EWS was developed for schools and districts to make it easy to input basic student data. It automatically calculates indicators related to attendance and course performance to identify if a student is at risk for dropout, or on-track for graduation. Using these predictor indicators, the EWS can progress monitor students for a range of identified needs beyond the realm of high school outcomes (Jerald, 2006; Heppen & Therriault, 2008). Student data can be monitored for indicators of risk that “flag” if a student is at

risk; e.g. number of course F's, GPA, quarter 1 absences, semester 1 absences, etc.

(Heppen et al., 2008).

The EWS uses the first-year data to identify students at risk using the on-track indicators (Table 1) and the “high-yield” indicators (Table 2). The “on-track” indicator requires that students have no more than one semester F, and no fewer than the number of credits required to be advanced to the 10th grade. In summary, “on-track” essentially reflects the bare minimum performance for a student at the end of her/his first year in high school. The minimum performance equals one-fourth the total number of credits required for graduation, minus one. In Idaho, school districts vary in graduation requirements; e.g. Table 1 illustrates a school operating on a block schedule that requires 46 credits for graduation.

Table 1. Freshmen On- and Off-Track Indicators for an Idaho School Requiring 46 Credits to Graduate

Number of Semesters with Fs in Core Courses	Number of Credits Accumulated Freshman Year	
	Less than 10.5	10.5 or more
2 or more semesters	Off track	Off track
0 or 1 semester	Off Track	On track

Heppen, O’Cummings, & Therriault (2008) stress that those students who are identified as “off-track” at the end of their first year in high school should be considered at risk for dropout and should be targeted for intervention. Although empirical evidence is emerging, the on-track indicator has revealed to be a quality measure to predict high school outcome. In his review of effective early warning systems from around the country, Jerald (2006) notes that the on-track indicator was 85% successful in predicting which members of a freshman class would not graduate from a 1999 study in Chicago.

The “high-yield” indicators are research-based, strong, early warning signs that predict if a student will graduate from high school. Table 2 summarizes the indicators that suggest students are at risk (Heppen, O’Cummings, & Therriault, 2008). There are four different benchmarks that “red flag” a student that may be at risk for dropout including: the equivalence of more than 10% of instructional time missed during the first year, a GPA under 2.0, and/or at least one failed course. As in the case of the on-track indicators, the high-yield indicators are in the developing stages of establishing empirical evidence, but they do show promise. In fact, low attendance during the first 30 days of ninth grade were found to be a more powerful predictor than any factor from the eighth grade including test scores, age and academic failure (Jerald, 2006). And research demonstrates that information about absences may be the most practical indicator for identifying students in need of early interventions (Jerald, 2006; Allenworth & Easton, 2007; Heppen, O’Cummings, & Therriault, 2008).

Table 2. Summary of “High-Yield” Indicators

Type of Information	Indicator	Brief Description	“Red flag” (indicates a student may be at risk for drop out)
Attendance	Absenteeism Rate	Number of days absent during the first 20 days and each quarter of the first year in high school	The equivalent of more than 10% of instructional time missed during the first year
Course Performance	Course failures	Number of Fs in any semester-long course during the first year in high school	One failed course
	GPA	GPA for each semester and cumulative GPA	GPA under 2.0
	On-track indicator	Combination of number of Fs in core academic courses and credits earned during the first year of high school	Two or more Fs in core academic courses and/or fewer than one-fourth of the credits required graduate minus one

It is important to note that these on-track and high yield indicators (Tables 1 and 2) have been developed and defined in heavily urbanized contexts (Jerald, 2006; Heppen, O’Cummings, & Therriault, 2008; Neild et al., 2008). Up to this date, there are no known duplications of the effectiveness of this tool in areas that are less urbanized or even those that might be considered rural. The current body of knowledge would benefit from further research in this area, which this paper attempts to address.

Issues Related to Dropout Definitions, Rates and Reporting

Dropout rates vary based on how the term is defined and how the data is collected, but current reviews of literature place the national dropout rate from 9.3%

(National Center for Education Statistics, 2008) to one-third of public high school students every year (Monrad, 2007).

This issue of dropout data is complicated at the nationwide and statewide level because there is a lack of 1) accurate dropout data collection and 2) a standardized statistical method used to report dropout rates. Montecel et al. (2004) report that the lack of accurate dropout numbers is a primary reason schools are losing children, and that for the Latino population, whose children drop out in numbers higher than other groups, “the situation has reached a crisis level” (p. 171). Montecel et al. (2004) cite U.S. Census Bureau data revealing that 43% of the Latino population did not earn a high school diploma, and of that group, 26% had dropped out before the 9th grade. Larger cities like New York, Detroit, Baltimore, Chicago, and Philadelphia show the highest rates of dropout, with some estimates of dropout rates around 50% (Neild et al., 2008). Current rates in Idaho retrieved from the 2007-2008 Idaho State Report Card lists the state graduation rate at 88% (Idaho State Department of Education, 2008).

Although the factors that lead to dropout before the ninth grade are significant, the discussion remains beyond the scope of this paper. Research has demonstrated however that the ninth grade year greatly impacts a student’s chance of graduating, even when taking in account eighth grade risk factors related to social background, previous academic performance and school engagement (Jerald, 2006; Neild et al., 2008).

In 2001, the No Child Left Behind Act (NCLB) helped redefine student achievement at the secondary level by including graduation rates and math proficiency in Adequate Yearly Progress (AYP) state-defined standards (Herlihy, 2007). As a result, NCLB legislation has helped to reveal inconsistent data collection practices. According to

the Urban Institute, there is currently no “widely accepted and scientifically validated method for calculating graduation rates” that could be “systematically applied” to the data that exists in our nation’s states, districts, and schools (Swanson, 2004).

Additionally, schools are given liberty for creating withdrawal codes; e.g. some schools assign self-reported dropouts with withdrawal codes like General Education Diploma (GED). Furthermore, other schools underutilize the voluntary withdrawal code (as most dropouts do not report they are leaving) (Kennelly & Monrad, 2007). While beyond the parameters of this research project, the distinction between a high school graduate and the obtainer of a GED is an important one, as the economic benefits are not the same (Ou, 2008).

In Idaho, dropout statistics are computed using the same method as the National Center for Education Statistics (NCES), Institute of Education Sciences, U.S. Department of Education. The dropout statistics are computed using an annual event rate with data collected from the first Friday in November to the first Friday of the next November. The event rate is calculated by dividing the total number of dropouts by the total number of enrollment or membership of the period by grade. The annual reports released by the NCES on the dropout and completion rates in the United States, are based on three primary data sets: the annual October Current Population Survey (CPS), the annual Common Core of Data (CCD) collections, and the annual GED Testing Service (GEDTS) statistical reports (Laird et al., 2008).

However, both the Center for Labor Market Studies and the Urban Institute state that the NCES dropout data collection methods are flawed and unrepresentative of the

population (Lewis, 2003; Swanson, 2004). The national average completion or dropout rate is computed by the NCES without including about two dozen states as well as the largest states of California, Texas, and New York. These states are excluded because their definition does not align with the ones used by NCES; e.g. the states may collect data with different time intervals or may exclude GED graduates in the total completion rate (Lewis, 2003). The inapplicability of the NCES statistics as a national snapshot is a reflection of a larger problem of inaccurate high school dropout and completion information from inconsistent data collection practices (Lewis, 2003) to outright deception of withdrawal codes to meet AYP state standards (Swanson, 2004).

For example, in the annual NCES compendium reports, researchers note that the *National Event Dropout Rate* (the percentage of youth ages 15 through 24 in the United States who dropped out of grades 10–12 from either public or private schools in the 12 months between one October and the next) data measure is:

...not well suited for studying how many people in the country lack a high school credential irrespective of whether they attended U.S. high schools, nor does it provide a picture of the dropout problem more generally because it only measures how many students dropped out in a single year, and students may reenter the school system after that time (Laird et al., 2008, p. 3).

And, the report continues for the *National Status Dropout Rate* (the percentage of individuals who are not enrolled in high school and who do not have a high school credential, irrespective of when they dropped out) data measure:

While useful for measuring overall educational attainment among young adults in the United States, the status dropout rate is not useful as an indicator of the performance of schools because it includes those who never attended school in the United States (Laird et al., 2008, p. 6).

The status completion rate includes individuals who may have completed their education outside the United States, so the rate is not suited for measuring the performance of the education system in this country (Laird et al., 2008, p. 8).

The Department of Education for the State of Idaho's most current *School Report Card* cites the current high school completion rate for 2007 at 88% (Idaho State Department of Education, 2008). Table 3 includes the definition used by the state of Idaho to define "dropout" which is used to identify populations for data collection.

Table 3. Definition of “dropout” in the state of Idaho

A drop out is a student who:	Was enrolled some time during the current year but was not enrolled at the end of the current regular school year; or
	Was enrolled at the end of the prior regular school year and expected to be part of the membership (i.e., was not reported as a drop out the year before) of the current school year but did not enroll in the current school year; and Has not graduated from high school or completed a state or district approved educational program
And does not meet any of the following exclusionary conditions:	Transfer to another public school district, private school, or other state or district approved program;
	Temporary school-recognized absentee due to suspension or illness or death

How to define “dropout” and collect data on dropout rates becomes problematic because of the inconsistency at the state and national levels. For the purposes of this research project, “dropout” will be defined using the state of Idaho’s definition (Table 3), which will be further discussed in the “Methods” section (*Drop out Rate, FAQ's*, 2008).

CHAPTER 3: METHODS

Design of the Study

This research project was completed at a high school in a city in Idaho using the attendance, Grade Point Average (GPA) and outcome (graduated or not graduated) ninth grade 2004-2005 data from the twelfth grade 2007-2008 graduating class. The participants were selected because of the convenience to the researcher conducting the project as well as the less urbanized sample it represented.

The 2007-2008 senior list was received from the school registrar and included 246 students. From this sample, 59 students were excluded due to lack of freshmen data, and 15 students were excluded due to lack of confirmed graduation information, leaving a total sample of N=172. This list was created at the end of May 2008, and was revised on October 21, 2008 to include the students who had received their diplomas after successfully completing summer school.

In this project, the dependent variable was the graduation outcome using the state of Idaho's definition (Table 3), and the independent variables were the predictor indicators from the research-based EWS (Tables 1 and 2). Selected resulting data from the EWS were coded into binary variables to perform statistical analyses (Table 4).

Sample and Population

According to the U.S. Census Bureau, the community selected for this study had an estimated population (2006) of 76,587, with 18,090 households reporting in 2000. In 1999, the median household income was \$34,758; 12.4% of the population was below the poverty line. The school selected for this study had 1,261 total students enrolled for the

2007-2008 school year comprised of the following demographics: English Language Learners 21.73%, Free/Reduced Lunch 59.08%, Special Education Participants 16.18%, Migrant 0.95%, Whites 57.73%, Hispanics 31.25%, Other 11.02%. The school selected for this research project required 46 credits to graduate for the 2004-2005 entering freshmen class (Table 1).

Data Collection

Data was collected from the computerized attendance program that was used during the 2004-2005 school year. The 2007-2008 senior registrar list was the starting point for the data collection process. If the student's information appeared in the 2004-2005 ninth grade database, the student's identifying information was coded, and the attendance, GPA and credit completion data were entered in the EWS excel spreadsheet. If the name was not in the 2004-2005 database, the student was not included in the study and no other information was collected.

The Dependent Variable

Using the state of Idaho's definition, high school outcomes were categorized into four different types of dependent variables. "Graduated" was defined as either receiving a diploma or GED. "Not graduated" was defined as a student who 1) officially was coded as dropped out 2) had no follow-up information or 3) was listed as a 13th grader for the 2008-2009 school year.

Independent Variables

The independent variables selected for this study were from the EWS tool created by the National High School Center. The independent variables were extracted from the on-track and high-yield indicators outlined in Tables 1 and 2. These independent

variables are considered the early warning signs that signal if a student may be at risk for dropping out of high school (Jerald, 2006; Heppen and Therriault, 2008).

Absences

In alignment with research, the absence count was separated into five variables: the first 20 days, quarter 1, quarter 2, quarter 3, and quarter 4 (Allensworth & Easton, 2007; Heppen, O’Cummings, & Therriault, 2008). The number of absences can be separated into regular intervals, including the first 20 days, in order to calculate the number of days absent as well as the daily attendance rate. Research demonstrates that indicators related to attendance from the first few weeks of the freshman year are related to whether a student will graduate or not (Nield et al., 2008; Heppen, O’Cummings, & Therriault, 2008).

The high school selected for this research project operated on a block schedule of rotating A and B days consisting of four classes per day, 87 minutes per class. Missing even one out of four classes on a block schedule is missing 25% of the day. If a student’s absence was unverified for at least one absence during the school day, the data was entered as one absence in the EWS, with a maximum of one absence per day. Similarly, the school this research was conducted within considers an absence for a specific class in the block schedule as a separate unit.

Excused absences were not included in the EWS because these absences could be school-related, medical-based and/or parent approved.

Academic Achievement

The other primary independent variables used in this study are those related to total credits earned, the number of core credits failed, and the student's GPA at the end of the student's ninth grade year (Jerald, 2006; Heppen, O'Cummings, & Therriault, 2008).

Binary Variables

For the purposes of the cross tabulation and logistic regression analyses used in this study, the dependent variable and three of the independent variables were converted to binary variables, based on previous research criteria (Heppen, O'Cummings, & Therriault, 2008). Table 4 displays these conversions.

Table 4. Binary Variables

Original Dependent or Independent Variable		Converted Binary Variable
Dependent Variable: "Graduation" Outcome defined by those officially listed as graduating and/or receiving a GED		Graduated (Yes or No)
Independent Variables	First 20 days absences	Absent 10% or more (Yes or No)
	Core credits failed for freshman year	2 or more (Yes or No)
	Credits earned during freshman year	10.5 or less credits (Yes or No)

CHAPTER 4: RESULTS

Results

The EWS data was imported and coded into SPSS 17.0; results were determined using the cross tabulation, nonparametric correlation, and logistic regression analyses. The cross tabulation was included to determine the sensitivity, specificity and classification accuracy of three, specific screening measures; sensitivity, specificity and classification accuracy are critical features of a screening measures' effectiveness (Mellard & Johnson, 2008; Johnson, Jenkins, & Petscher, in press). Sensitivity is defined as the measure's ability to identify "true positives" (TP); i.e. the students who did not graduate/obtain a GED. Specificity is defined as the measure's ability to identify "true negatives" (TN); i.e. the students who graduated/obtained a GED. Conversely, a "false positive" (FP) would be a student was identified as not graduating/obtaining a GED but did, and a "false negative" would be a student identified as graduating/obtaining a GED but did not. Classification accuracy (CA) is defined as the correct classification of "true positives" and "true negatives" (Mellard & Johnson, 2008).

The sensitivity, specificity and classification accuracy of the three predictor variables, EWS flags, First 20 days flags and On-track/off-track indicators, were run in a cross tabulation against the graduation outcomes of students. Table 5 summarizes these results.

Table 5. Summary of Efficiency for EWS Flags, First 20 Days Flags and On-track Indicators for Predicting High School Outcomes (N=172)

Predictor Variable	Sensitivity	Specificity	Classification Accuracy
EWS flags (any)	1	.55	.59
First 20 days flag	.46	.82	.80
On-track/off-track indicator	.66	.96	.88

Given that the on-track/off-track indicator uses a fairly narrow definition for being classified as “off-track” (essentially 10.5 credits or less at the end of 9th grade), the specificity is high (.96) for this indicator. The sensitivity for the on-track/off-track indicator is less effective at .66, but the classification accuracy remains strong at .88. The specificity for EWS flags predictor variable is perfect at (1), but the sensitivity (.55) and classification accuracy (.59) are low suggesting this measure is over-identifying students.

Conversely, the first 20 days flag predictor variable has low sensitivity (.46), but acceptable levels of specificity (.82); the specificity level upholds previous research that establishes the importance of the first 20 days (Heppen, O’Cummings, & Therriault, 2008).

In Table 6, eight of the predictor indicator variables and the graduation outcome variable were run in a Spearman’s rho correlation. While all of the correlations between the graduation outcome (9) and the other variables (1-8) are statistically significant, none of the relationships are strong. The strongest relationship (-.414) is an inverse one between the core credits failed (6) and the graduation outcome (9).

Table 6. Summary of Spearman's rho Correlation Analysis for Variables Predicting High School Outcomes (N=172)

	2	3	4	5	6	7	8	9
1. First 20 days Absence	.837 .000	.364 .000	.367 .000	.375 .000	.171 .025	-.180 .018	-.271 .000	-.260 .001 (C) (Sig)
2. Q1 Absence		.481 .000	.459 .000	.437 .000	.272 .000	-.244 .001	-.390 .000	-.273 .000
3. Q2 Absence			.446 .000	.429 .000	.239 .002	-.239 .002	-.364 .000	-.253 .001
4. Q3 Absence				.577 .000	.334 .000	-.268 .000	-.435 .000	-.129 .092
5. Q4 Absence					.314 .000	-.304 .000	-.286 .000	-.181 .017
6. Core Credits Failed						-.711 .000	-.721 .000	-.414 .000
7. Credits Earned							.624 .000	.332 .000
8. GPA							.370	.000
9. Graduation Outcome								

p<.05, (C) is Correlation Coefficient, (Sig) is Statistical Significance

Because of the poor specificity of the EWS flags (Table 5), the relative strength of each predictor variable was examined in a logistic regression. In Table 7, the predictor indicators were analyzed to determine the statistical relationships between them and the graduation outcomes from the data collected in the EWS. The analysis was used to predict graduation from high school using eight different predictor variables.

Table 7. Results of Logistic Regression with all Predictor Variables

Predictor	B	SE	Wald	Sig.	OR	Sen.	Spec.	TP	FP	TN	FN	C A
No Pred.	2.348	.270	75.497	.00	10.467	0	100	0	0	157	15	91.3
All Pred.						53.3	99.4	8	1	156	7	95.3
First 20	-.017	.429	.002	.968	.983							
Quarter1	-.195	.228	.734	.392	.823							
Quarter2	-.399	.177	5.101	.024*	.671							
Quarter3	.149	.146	1.05	.306	1.161							
Quarter4	.163	.138	1.40	.237	1.177							
CoreFail	-1.77	.650	7.46	.006*	.169							
CredEarn	-.547	.350	2.437	.118	.579							
GPA	1.632	.969	2.837	.092	5.114							

* indicates statistical significance, $p < .05$

“Quarter 2 absences” and “Core classes failed” were significant predictors of graduation, but the other six predictors were not statistically related to graduation. For every unit decrease in Quarter 2 absences, the odds of graduation (versus dropout) increase by a factor of .33, and for every unit decrease in Core classes failed, the odds increase by a factor of .83.

As measures of practical significance, the Cox and Snell R-squared value explains .256 of the variance for all predictor variables. The Nagelkerke R-squared value explains .573 of the variance for all predictor variables.

Past studies have found the number of absences in the first 20 days to be a strong predictor of high school graduation. However, in this analysis, the first 20 days

demonstrated no statistical significance. The classification accuracy (CA) showed a slight increase from 91.3 (No Pred) to 95.3 (All Pred), but because the base rate for dropout is so low, the level of efficiency for the screening measure would benefit from further research. The identification of the 8 students (FP) who did not graduate/obtain a GED compared to the 7 students who were not identified but should have (FN), presents issues with the effectiveness of the EWS. To determine the cost benefit analysis of implementing a screening measure with limited effectiveness versus the identification of students at risk would be an important follow-up to this study.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this research was to investigate possible predictors for successful and unsuccessful outcomes of Idaho high school students. This research used the Early Warning System developed by the National High School Center to collect student data on predictor indicators based on absences, GPA, courses completed and failed. This data was then entered in a logistic regression model to identify predictor indicators that could be used at the systemic level. In doing so, the findings of this research will be connected to current policy changes in education. Findings from this research will be applied to deepen understandings of RTI processes at the secondary school level. Given the state of Idaho's initiative to develop RTI frameworks and guidelines, as well as the continuing dropout crisis at the state and national level, this study is timely and important as a research-based contribution to address these upcoming issues.

Limitations

There is an inevitable inaccuracy to the dropout data that is part of the educational and political system this research was conducted within because of how 1) the rate is calculated at the national, state, district and school level, 2) the term is defined by states and 3) the student is coded by districts and schools.

Another important limitation to this research is the procedure in which the data was collected and selected. This project used the senior list to compare to the freshmen data, and could have begun instead with the original freshmen list to compare to the senior list (outcome). The original freshman list contains 625 active and inactive student

names compared to the 246 student names on the senior list. The senior list was selected based on time and resources available, as well as original research intent, but the freshman list would have been the superior of the two.

Lastly, to the greatest extent possible, it is suggested that when creating district-specific databases to identify indicators, at least two cohorts or groups of students should be included and followed at least 1 year after the class graduation. The data for student characteristics collected should also include demographics, academic performance, and educational engagement (Jerald, 2006; Heppen, O’Cummings, & Therriault, 2008). This study was thus limited because it only included one cohort, it did not follow students a full year after graduation, nor did it include demographic data. Although these are suggested guidelines, the lack of adherence by this study may have affected the statistical analyses.

Conclusions

From the logistic regression analysis, the statistically significant relationships between 1) graduation outcomes and core credits failed and 2) graduation outcomes and quarter 2 absences are in alignment with past research. However, it is unclear why only these two predictor variables are significant, and not the other six. One reason for the lack of statistical significance may be the sample size ($n=172$) and the possible lack of a representative sample. Given that the original freshmen list of active and inactive students included 625 student names, there is a significant amount of student outcomes that were not included in this study.

It is also unclear as to why the “First 20 days” predictor variable was not found to be statistically significant, as this has been a strong indicator in other studies. The lack of statistical strength may be in part due to the lack of accurate attendance data collected

during the 2004-2005 school year as the attendance data collection program was introduced for the first time that school year. Additionally, the first 20 days of school can be a challenging time for teachers and students because of schedule inaccuracies, schedule changes, and a lack of familiarity for students with school staff and surroundings. These factors may have contributed to an inaccurate attendance data collection set.

Nevertheless, for predicting graduation outcomes, “Quarter 2 absences” and “Core credits failed” are statistically significant as indicators and uphold previous studies. These indicators may be statistically significant due to the localized demographics and it may suggest that less urbanized environments (than Chicago and Philadelphia) may have different predictor indicators. Correspondingly, Heppen, O’Cummings, & Therriault, (2008) note that local contexts impact risk factors and “the pathways to dropping out do vary in some school systems” (p. 7). There may be additional predictor indicators embedded in the two found significant in this study, or there might may not have been enough initial student data to begin with.

From the correlation data, there were no strong relationships demonstrated between the predictor and outcome variables. There is a weak inverse relationship (-.414) between the number of core credits failed and graduation outcomes. However, because it is suggested at least two cohorts of students should be tracked in longitudinal studies in order to define the “highest” yield indicators for a local school district, this may or may not be representative of the localized sample.

The conclusions from this research project do not comprehensively support, nor strongly align with previous research projects and longitudinal studies conducted in more heavily urbanized environments than the one selected for this study. Based on the data

collected in this study, it is unclear if the results of this research are due to a less urbanized sample, a flawed approach to data collection, or a sample size too small to draw any meaningful conclusions from. According to previous research, this study would require additional follow-up in order to conclude the effectiveness of the indicators found in the analyses (Jerald, 2006; Allensworth & Easton, 2007; Heppen, O’Cummings, & Therriault, 2008).

Recommendations

Given the economic and social consequences of identifying students at risk for dropout, research should continue to define those predictor indicators for the secondary level. Based on the results of this study, it is problematic to predict outcomes without having complete and accurate data to begin with. Implications for practice include the implementation of a study similar to this to begin the data collection process at the district level to isolate those indicators unique to the area (Jerald, 2006). At the very least, schools should recognize the importance of the ninth grade year and focus strong supports and interventions at this grade level. Past studies have established that the first few weeks and months of the freshman year are related to a student’s graduation (Jerald 2006; Allenworth & Easton, 2007), and all students would benefit from screening measures for additional support.

This research project is only the beginning of a developing body of knowledge to implement effective, research-based RTI frameworks at the secondary level in Idaho. It is thus to be expected that the results found in this project are inconclusive at this time. Furthermore, the goal of this project, to identify predictor indicators for Idaho students at risk, is only the first step in addressing the dropout crisis. The next important step is to identify effective intervention strategies to prevent outcomes that lead to high school drop

out. In summary, any of the above issues, whether it be RTI frameworks at the secondary level, localized predictor indicators for dropout prevention, and/or identifying effective dropout prevention strategies, would certainly benefit from further research, as ultimately so will all students.

REFERENCES

- Allensworth, E., & Easton, J. Q. (2007). *What matters for staying on-track and graduating in Chicago Public High Schools: A close look at course grades, failures and attendance in the freshman year*. Chicago: Consortium on Chicago School Research.
- Bender, W. N. & Shores, C. (2007). Implementation of a standard treatment protocol response to intervention. In W. N. Bender & C. Shores, *Response to intervention: A practical guide for every teacher* (pp. 21-45). Thousand Oaks, CA: Corwin Press.
- Burns, M. K. & Gibbons, K. (2008). *Implementing response-to-intervention in elementary and secondary schools: procedures to assure scientific-based practices*. New York, NY: Routledge.
- Canter, A., Klotz, M. B. & Cowan, K. (2008). Response to intervention: The future for secondary schools [Electronic version]. *Principal Leadership*, 8(6), 12-15.
- Drop out Rate (FAQ's)* (2008). Retrieved December 6, 2008, from <http://www.sde.idaho.gov/ipd/reportcard/DropoutRate03.htm>
- Duffy, H. (2007). *Meeting the needs of significantly struggling learners in high school: A look at approaches to tiered intervention*. Washington DC: National High School Center.
- Fuchs, D. & Fuchs, L. S. (2005). Responsiveness-to-intervention: A blueprint for practitioners, policymakers, and parents [Electronic version]. *Teaching Exceptional Children*, 38, 57-61.
- Fuchs, D. & Fuchs, L. S. (2006). Introduction to response to intervention: What, why and how valid is it? [Electronic version]. *Reading Research Quarterly*, 41, 93-99.
- Fuchs, L. S. & Fuchs, D. (2007). A model for implementing responsiveness to Intervention [Electronic version]. *Teaching Exceptional Children*, 39(5), 15-20.
- Griffiths, A.-J., VanDerHeyden, A. M., Parson, L. B. & Burns, M. K. (2009). Practical applications of response-to-intervention research [Electronic version]. *Assessment for Effective Intervention*, 32, 50-57.

- Heppen, J. B., O’Cummings, M. & Therriault, S. B. (2008). *Developing early warning systems to identify potential high school dropouts*. Washington DC: National High School Center.
- Herlihy, C. (2007). *Toward ensuring a smooth transition into high school*. Washington DC: National High School Center.
- Idaho State Department of Education (2008). *School Report Card 2007-2008*. Retrieved December 15, 2008. <http://www.sde.idaho.gov/ipd/reportcard/SchoolReportCard.asp>
- Jerald, C. D. (2006). *Identifying potential dropouts: Key lessons for building and early warning data system*. Washington DC: Achieve, Inc.
- Johnson, E. S., Jenkins, J. R., & Petscher, Y. (in press). Improving the accuracy of screening procedures using research-based approaches. *Assessment for Effective Intervention*.
- Johnson, E., Mellard, D. F., & Byrd, S. E. (2005). Alternative models of learning disabilities identification: Considerations and initial conclusions [Electronic version]. *Journal of Learning Disabilities*, 38, 569–572.
- Johnson, E. S. & Smith, L. (2008). Implementation of response to intervention at middle school: Challenges and potential benefits [Electronic version]. *Council for Exceptional Children*, 40(3), 46-52.
- Kennelly, L. & Monrad, M. (2007). *Approaches to dropout prevention: Heeding early warning signs with appropriate interventions*. Washington DC: National High School Center.
- Laird, J., Cataldi, E. F., KewalRamani, A., and Chapman, C. (2008). *Dropout and Completion Rates in the United States: 2006* (NCES 2008- 053). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved November 20, 2008 from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2008053>.
- Lewis, A. C. (2003). NCES and dropouts [Electronic version]. *The Education Digest*, 69 (1), 68-69.
- Mellard, D. F. & Johnson, E. (2008). *RTI: A practitioner’s guide to implementing response to intervention*. Corwin Press.
- Montecel, M. R., Cortez, J. D., & Cortez, A. (2004). Dropout prevention programs: right intent, wrong focus, and some suggestions on where to go from here [Electronic version]. *Education and Urban Society*, 36, 169-188.
- Monrad, M. (2007). *High school dropout: A quick stats fact sheet*. Chicago: Consortium

of Chicago School Research.

- National Center for Education Statistics (2008). *The Condition of Education 2008 (NCES 2008-031), Indicator 23*. Retrieved November 29, 2008.
<http://nces.ed.gov/fastfacts/display.asp?id=16>
- Nield, R. C., Stoner-Eby, S., & Furstenberg, F. (2008). Connecting entrance and departure: the transition to ninth grade and high school dropout [Electronic version]. *Education and Urban Society, 40*, 543-569.
- Ou, S. (2008). Do GED recipients differ from graduates and school dropouts? Findings from an inner-city cohort [Electronic version]. *Urban Education, 43*, 83-117.
- Samuels, C. A. (2009). High schools try out RTI [Electronic version]. *Education Week, 28(19)*, 20-22.
- Shores, C. & Bender, W. N. (2007a). Implementation of a problem-solving response to intervention. In W. N. Bender & C. Shores, *Response to intervention: A practical guide for every teacher* (pp. 47-66). Thousand Oaks, CA: Corwin Press.
- Shores, C. & Bender, W. N. (2007b). Response to intervention. In W. N. Bender & C. Shores, *Response to intervention: A practical guide for every teacher* (pp. 1-19). Thousand Oaks, CA: Corwin Press.
- Swanson, C. A. (2004). *The real truth about low graduation rates, an evidence-based commentary*. Washington DC: The Urban Institute Education Policy Center.
- U.S. Census Bureau. (2006). *State and County Quickfacts*. Retrieved February 25, 2009, from <http://quickfacts.census.gov/qfd/states/16/1656260.html>.